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beneficial. In the former it will do no good whatever. This is mainly because in the former infection takes place probably by means of spores disseminated by the wind, so that whole fields soon become infected. It cannot be denied that an effectual remedy for wheat rust is still a great desideratum.

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Washington, D. C., Aug. 5.

The Ancient Libyan Alphabet.

IN *Science*, July 15, Dr. Brinton has some remarks on this subject, which I have read with surprise. The old Libyan alphabet, he says, "appears to have been in common use among the Berber tribes of north Africa long before the foundation of Carthage (1), . . . and in its forms is almost entirely independent of the Phœnician letters (2). It is composed of consonants called *tifinar* (3), and vowel-points, known as *tidebakin*. The latter are simple dots (4), the former are the lines of a rectangle, more or less complete (5). Several of them are found in the oldest Etruscan inscriptions (6). . . . The writers who have given especial attention to this little-known subject are Faidherbe, Duveyrier, Halévy, Bissuel, and, recently, Dr. Collignon (7)."

To avoid repetition, and facilitate reference, I have numbered the points in this passage on which I should like to offer a few observations.

1 and 2. What authority has Dr. Brinton for referring this alphabet to pre-Carthagenian times, and for stating that its forms are almost entirely non-Phœnician? I have hitherto regarded the Punic origin of the Libyan letters as an established fact accepted by all epigraphists of weight, and notably by Mommsen, who unhesitatingly recognizes their Semitic descent: "The Libyan or Numidian alphabet now as formerly in use amongst the Berbers in writing their non-Semitic language is one of the innumerable offshoots of the primitive Aramæan type. In some of its details it seems even to approach that type more closely than does the Phœnician itself. We are not, however, therefore to conclude that the Libyans received it from immigrants older than the Phœnicians. It is here as in Italy, where certain obviously more archaic forms do not prevent the local alphabet from being referred to Greek types. All that can be inferred is that the Libyan alphabet belongs to the Phœnician writing older than the epoch when were composed the Phœnician inscriptions that have survived to our time" (*History of Rome*, iii., 1).

It follows that the Numidian ancestors of the Berbers received their writing system from the Carthaginians, earliest Phœnician settlers on the north African sea-board, and, consequently, that the Libyan alphabet had no currency "long before the foundation of Carthage." The archaic forms referred to by Mommsen were the forms in use in Tyre and Sidon in pre-historic times, whereas the extant Phœnician inscriptions date from historic times; hence the discrepancies between the latter and those preserved by the Berbers, most conservative of all peoples.

3. Not the consonants alone, but the whole system (mainly, of course, consonantal as being Semitic) is called "*tifinar*," or rather "*tifnagh*." The sounds *gh* and *rh* interchange in the Libyan dialects (*Ghet* and *Rhet*; *Melghigh* and *Melrhurh*, etc.), so that it is not always easy to decide which is the original sound. But here there is no doubt that *gh* is organic; and Barth, for instance, always writes *Tefnagh*, plural *Tefnaghen*: "There was in particular a man of the name of Sâma, who was very friendly with me. On reading with him some writing in *Tefnaghen*, or the native Berber character, I became aware that this word signifies nothing more than tokens or alphabet. For as soon as the people beheld my books, and observed that they all consisted of letters, they exclaimed repeatedly, 'Tefnaghen — ay — Tefnaghen!'" (*Travels*, V., p. 116). There is, however, more in this word than Barth was aware of. When stripped of the common Berber prefix *te*, it reveals the "*Finagh*," i.e., "Phœnician," or "Punic" origin of the letters in their very name. Note the stress still falling on the root *fin*, as in *Pœni*.

4. F. W. Newman explains *Tidebákka* (pl. *Tidebákken*) to mean "a dot on or under the letter" (*Vocab.*), in fact any diacritical mark of the kind, and not merely vowel signs. Some, however,

are doubtless used to voice the consonants, as in Hebrew. Like other Semitic alphabets, Tefnagh had originally no vowels, but only three breathings, transformed in some systems (Greek, Italic) to pure vowels, in others (Cufic, Arabic) to semi-vowels and vocalic bases. But all this merely tends to strengthen the view that the Libyan is a Semitic alphabet.

5. This statement is to me unintelligible. In the published Libyan alphabets (Fr. Ballhorn, "Alphabete orientalischer und occidentalischer Sprachen," p. 8; Hanoteau, "Essai de grammaire de la langue tamachek," and others) curves occur quite as frequently as straight lines, while acute decidedly prevail over right-angles. Of the eight letters copied by Barth (I., p. 274) two only can be described as "more or less complete rectangles," forms which are certainly less common than, for instance, in Hebrew and Estranghelo.

6. It would be strange if resemblances did not occur between the Libyan and the characters of "the oldest Etruscan inscriptions," seeing that both have a common Semitic origin, the former directly through the Phœnician, the latter indirectly through the archaic Greek. But such resemblances obviously lend no color to Dr. Brinton's peculiar views regarding Libyco-Etruscan linguistic affinities.

7. Of the writers here referred to, Faidherbe and Halévy alone can be regarded as specialists. On the other hand, there are serious omissions, such as Dr. Oudney, who in 1822 first discovered the existence of the Berber alphabet; F. W. Newman, "Patriarch of Berber philology;" Mommsen and Hanoteau, as above; lastly, A. Judas, who was the first to clearly establish the Phœnician origin of these characters in a paper entitled "De l'écriture libyco-berber," contributed to the *Revue Archéologique* for September 1862.

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BOOK-REVIEWS.

Handbook for the Department of Geology in the U. S. National Museum. Part I. Geognosy.—The Materials of the Earth's Crust. By GEORGE P. MERRILL. Washington, Government Printing Office, 1892. 89 p. 12 pl.

THE U. S. National Museum is probably the greatest institution of its kind in this country. The museums located in New York, Cambridge, Boston, Philadelphia, and other large cities present to the residents of those places and to students many facilities for study. This is particularly the case with the American Museum of Natural History in New York and the Museum of Comparative Zoology in Cambridge. But neither one of these has been planned upon so extensive a scale, or is destined to attain such mammoth proportions, as the National Museum at Washington. The country at large is familiar with some things to be found at the museum from the numerous expositions at which displays of its treasures have been made; but no one who has not visited and lingered long in its great but crowded quarters at the National Capital can adequately realize the broad foundation upon which it is based, or the immense variety and scope of its collections. There are gathered together here materials which cover all human arts and all the natural sciences—anthropology in its widest sense, from the rude, chipped-flint implement of palæolithic man to the delicate *Sevres* china of civilized man; rocks and fossils from the most ancient formations to the most recent; animal forms from the minutest insect that flies to the hugest creature of land or sea. Scarcely an object, indeed, in which man has had aught to do, or to find interest in, but is to be found here.

The collections are not, either, lying idle. A large corps of curators is constantly at work, either arranging the old collections or studying and comparing the new. The results of these studies appear from time to time in the *Proceedings of the Museum*—a publication scarcely known to the public at large even by title, on account of its limited circulation—or else in the *Annual Reports of the Museum*, which are more widely known from being distributed as congressional documents. Unfortunately, these last usually appear from two to three years after the date they are stated to be reports for.

In the early days, when the Smithsonian Institution was the